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CURRENT SECT. RECORDS



Controlling White-Fringed Beetles

Controlling White-Fringed Beetles

White-fringed beetles¹ can seriously damage your field and garden crops and ornamental plants unless you take proper control measures. Both larvae and adults feed on peanuts, cotton, potatoes, tobacco, corn, and other crops, as well as on wild plants, such as wild asters, blackberries, and cocklebur.

RANGE AND SPREAD

White-fringed beetles occur in many parts of the southeastern United States, and north as far as Maryland. They could spread as far north as Pennsylvania to southern Iowa, and to irrigated areas of the Western States.

¹ *Graphognathus* spp.

The eggs, larvae, and adults are easily spread in commerce. Eggs can be attached to plants, farm machinery, or other objects that come in contact with the soil, and in hay harvested from infested fields in late summer or fall. Larvae are transported in soil, sod, nursery stock, and root crops. The adults attach themselves to seed cotton, hay, farm machinery and tools, and even to people.

DAMAGE

The larvae, or grubs, live in the soil and feed on the roots of many kinds of plants. They rarely cause uniform damage over a large continuous area; sometimes, they completely destroy



Feeding of adult white-fringed beetle.

plants in one part of a field and leave plants elsewhere in the field practically untouched. Affected plants usually turn yellow, wilt, and die. Those that survive seldom develop normally. Adult beetles feed on foliage of broadleaf plants, but usually cause little damage.

Larvae prefer root crops and plants with taproots to plants with fibrous roots. They may completely sever the main root. They sometimes feed on roots of young peach, pecan, tung, and willow trees, and on parts of dead plants in the soil.

These beetles damage plants growing in well-drained, sandy loam more than those in heavy clay soils.

A very dry summer can slow down development of the beetles. A heavy, week-long rain can kill many small larvae.

DEVELOPMENT

One generation of white-fringed beetles develops each year. Larvae spend about 9 months in the soil.

Soon after hatching, larvae enter the soil and feed on roots. They are legless, cream colored, and, when full grown, are about $\frac{1}{2}$ inch long. Full-grown larvae build cells in the soil where they transform into pupae. In about 2 weeks they develop into adults.

Adults begin emerging from the ground in early May and continue until early fall, depending on the area and the amount of moisture in the soil. Adult beetles are dark gray, are about $\frac{7}{16}$ inch long, and have a white fringe, or band, around the outer edge of their body.

All the adults are egg-laying females. They live for 2 to 5 months and lay eggs during most of that time. Eggs are laid in masses of 11 to 14 in the soil near roots or where soil is touching sticks, gravel, stems, or other objects lying on the ground or sticking out of the soil. A sticky substance coats the eggs and makes them adhere to one another and to roots or other

objects. Beetles that feed on peanuts, cocklebur, ragweed, soybeans, and strawberries lay a great many eggs; those that feed on cowpeas, lespedeza, blackberries, and tobacco lay few eggs.

Eggs hatch in about 17 days in warm weather but take longer to hatch in cool weather. A few eggs overwinter and hatch in the spring, but most of these insects overwinter in the soil as larvae.

CULTURAL CONTROL

To help control white-fringed beetles, rotate peanuts, soybeans, and velvetbeans—crops that encourage an increase in the numbers of beetles—with crops that are not favorable to such an increase: pasture grasses, small grains, and corn. Plant corn in solid stands; do not interplant with a legume.

Do not grow susceptible crops in the same field more often than once every 3 or 4 years.

Add organic matter to the soil. An economical method is to plow under a winter cover crop. This will help reduce larval damage.

CHEMICAL CONTROL

Cropland

You can use DDT or chlordane to treat soil to control white-fringed beetles on land to be planted to certain specified crops. You can apply these insecticides as sprays prepared from an emulsifiable concentrate or a wettable powder, or as granules, ready to apply.

Two methods may be used to apply these insecticides. The most effective method is to broadcast the insecticide with hand or power ground equipment or an airplane. This is the only method recommended for land to be planted to vegetable crops. If you broadcast the insecticide, apply it before you plant the crop. Disk it or use other equipment to mix it immediately into the top 3 inches of the soil. Be



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Applying granular insecticide to soil.

sure to apply the insecticide evenly. If there is a heavy growth of vegetation on the field, plow before you apply the insecticide.

If you are not growing vegetables on the land, you can apply the insecticide in the drill row at planting time. Deposit the insecticide below the depth of the seed. You can apply the insecticide by itself or combine it with fertilizer. This method does not give as good control as the broadcast treatment.

You can apply DDT to soil to be planted to cotton, peanuts, potatoes, and turnips. If you broadcast, apply 10 pounds active ingredient per acre. If you treat the rows, apply 2 to 3 pounds active ingredient per acre.

You can apply chlordane to soil to be planted to cotton and potatoes. If you broadcast, apply 5 pounds active ingredient per acre. If you use the row treatment, apply 1 to 2 pounds active ingredient per acre.

If the distance between drill rows is more than 6 feet, apply minimum

dosage per acre; if it is less than $3\frac{1}{2}$ feet, apply maximum dosage per acre.

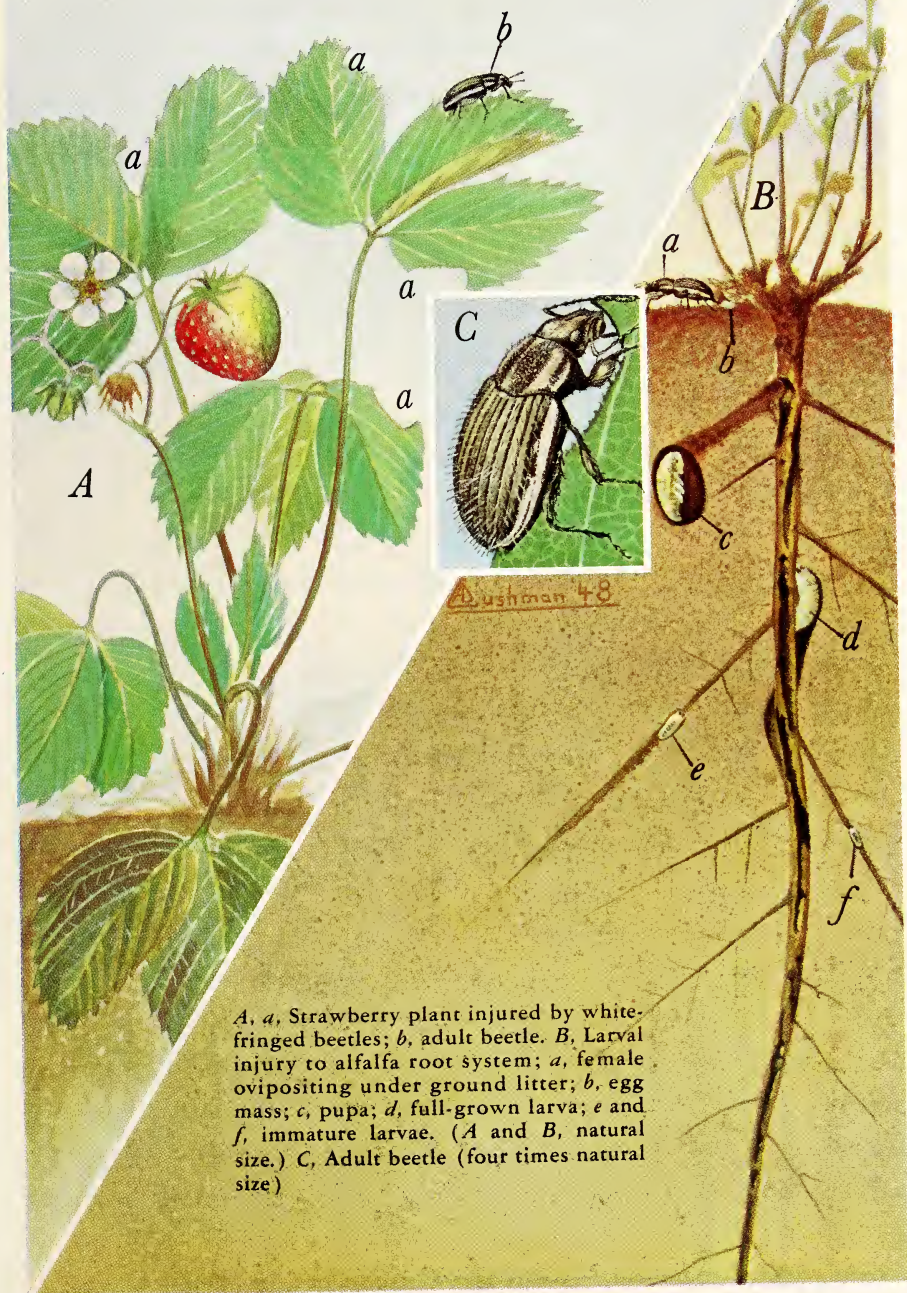
If you broadcast DDT, this will control the beetles for 4 years; if you broadcast chlordane, it will give control for 3 years. Row treatment with either insecticide controls the beetles for 1 year.

For control on other crops, consult your local agricultural agent, State agricultural experiment station, or the U.S. Department of Agriculture.

Nonagricultural Land

Federal or State quarantine programs may require you to control white-fringed beetles on nonagricultural land, such as fields not used for grazing, railroad yards and sidings, storage areas, nurseries, and roadways. In these places, you may use dieldrin. Apply it only under the supervision of Federal and State plant pest control workers. They can give you further information and proper rates of application for dieldrin.

WHITE-FRINGED BEETLE



A, a, Strawberry plant injured by white-fringed beetles; b, adult beetle. B, Larval injury to alfalfa root system; a, female ovipositing under ground litter; b, egg mass; c, pupa; d, full-grown larva; e and f, immature larvae. (A and B, natural size.) C, Adult beetle (four times natural size)

Quarantines

To prevent the spread of white-fringed beetles, Federal and State quarantines have been established. These quarantines are designed to control the movement of articles that could carry the pests.

In quarantined areas, plants with roots attached, certain crops, equipment, soil, forest products, and other articles must be certified by a plant pest control inspector before they can be shipped to uninfested areas. To be eligible for certification, the articles must be treated or found to be free of white-fringed beetles.

For further information about State and Federal quarantine regulations contact your State department of agriculture, county agricultural agent, or a plant pest control office of the U.S. Department of Agriculture.

FINDING AND REPORTING INFESTATIONS

You can help prevent the spread of white-fringed beetles by finding and reporting infestations.

Finding Larvae

- Look around roots, particularly if plants are wilting or dying.
- Look for wilting, reddening, and yellowing of young plants in fields, vegetable gardens, and flower beds. Examine the soil where there are skips in rows of plants.
- Dig up abnormal plants and look for larvae in the soil and on the roots. Examine several plants that are wilting or yellowing.

Finding Adult Beetles

- Look for sawtooth cuts on outer edges of leaves; adults do not eat holes in the leaves. (See photo, p. 2.)



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Looking for larvae in soil in cottonfield infested with white-fringed beetles.

- Look for damage on leaves of crops such as soybeans, velvetbeans, peanuts, cotton, and clover.

- Look for adults on broadleaf weeds in fields, terraces, turnrows, and fence lines. If weeds and small grains are growing in the same field, beetles will feed on the weeds.

- If you do not find adults on leaves, inspect the base of the plants and look under leaves and in the grass nearby.

Reporting

If you find adult beetles or larvae that resemble the ones in the color drawing, place several in a small bottle of rubbing alcohol and send the bottle to your local agricultural agent, the nearest plant pest control inspector, your State department of agriculture, or your State entomologist.

When sending specimens, include your name and address and tell where and when the insects were found. *Do not send live insects through the mail.*

PRECAUTIONS

Insecticides used improperly can be injurious to man and animals. Use them only when needed and handle them with care. Follow the directions and heed all precautions on the labels.

Keep insecticides in closed, well-labeled containers in a dry place. Store them where they will not contaminate food or feed, and where children and animals cannot reach them. Promptly dispose of empty insecticide containers; do not use for any other purpose.

When handling an insecticide, wear clean, dry clothing.

Avoid repeated or prolonged contact of insecticide with your skin.

Wear protective clothing and equipment if specified on the container label. Avoid prolonged inhalation of insecticide dusts or mists.

Avoid spilling an insecticide on the skin and keep it out of the eyes, nose, and mouth. If you spill any on your skin or clothing, remove contaminated clothing immediately and wash the skin thoroughly with soap and water. Launder clothing before wearing it again. If the insecticide gets in the eyes, flush with plenty of water for 5 minutes and get medical attention.

After handling an insecticide, do not eat, drink, or smoke until you have washed your hands and face. Wash any exposed skin immediately after applying an insecticide.

Chlordane and dieldrin can be absorbed directly through the skin in harmful quantities. When working with these insecticides in any form, take extra care not to let them come in contact with the skin.

Do not feed potatoes, turnips, peanut forage, hulls, or silage made from plants from fields treated with DDT or chlordane to dairy animals or animals being finished for slaughter.

Avoid drift of insecticide to nearby wildlife habitats, bee yards, crops, or livestock. Do not apply insecticides under conditions favoring drift from the area to be treated.

Keep insecticides out of all water sources such as ponds, streams, and wells. Do not clean spraying equipment or dump excess spray material near such water.

Dispose of empty insecticide containers at a sanitary land-fill dump, or crush and bury them at least 18 inches deep in a level, isolated place where they will not contaminate water supplies.

Prepared by
Entomology Research Division and
Plant Pest Control Division
Agricultural Research Service

**The white-fringed beetle is easy to mistake for other insects.
The color illustrations will help you distinguish it from similar-
looking beetles.**

**This leaflet supersedes Leaflet 401,
“The White-Fringed Beetle: How to Control It.”**



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